

tSML - FO Module 19"/0.5U angled 4x MPO/MTP[®] Male/24x LC duplex 9/125 μ OS2



tSML - tde Semi Modular Link

tSML is a modular developed cabling system, which consists of two core components: module and trunk cable. The system components, preterminated with connectors and tested ex works, facilitate very fast installation of both twisted pair and fiber-optic cables. Ready-made trunk cables, providing a high number of pairs or fibers, can simply be plugged together using patch panels. Up to 96x LC duplex and/or 48 x RJ45 of haven can be accommodated in such a way on 1U. At the heart of the System are MPO/MTP[®] and Telco connectors, with which 12 optical fibers or 24 copper pairs can be connected simultaneously. Fiber-optic and twisted pair modules can be combined on 1U within a panel without difficulty.



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Technical Data

Box	stainless steel
Front plate	stainless steel
Entry	4 x MPO/MTP [®] Male adapter (green) back
Exit	24 x LC duplex adapter (blue) front
Dimensions	19", 0.5 U, depth: 10.5 cm (outside) / 20.5 cm (centered)
Identification	silkscreen at the front
	19" mounting set enclosed
	QS-Managementsystem ISO 9001, ISO 14001 and TL 9000

tSML - FO Modules 19"/ 0.5U angled

Box	stainless steel
Front plate	stainless steel
Dimensions	19", 0.5U, depth: 10.5 cm (outside) / 20.5 cm (centered)

FO Adapters

Type	LC Duplex
Application	Singlemode OS2 PC
Design	One-Piece without flange
Connector style	SC simplex
Color	Blue
Material	Plastik
Sleeve	Zirkonia Staight Split
Shutter	--
Manufacturer	tde

FO Adapters

Type	MPO/MTP [®]
Application	Singlemode OS2 APC
Design	without Flange
Connector style	SC Simplex
Key Orientation	Type A, Key up/down
Color	Green
Material	Plastic
Sleeve	--
Shutter	--
Standards	IEC 61754-7 TIA 604-5
Manufacturer	US Conec

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FO Connectors

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a defined fiber height of 1 - 3.5 μ m. The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m.

Connector

Type	MPO/MTP [®] APC Male Push Pull Locking with Elite Pins (green)
Ferrule	12 Fiber SM Elite [®] ferrule, PPS
Boot colour	Black
Temperature range	-40°C bis +75°C
Manufacturer	tde/US Conec

Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
9/125 μ OS2	MPO/MTP [®] APC	1310 / 1550 nm	≤ 0.10 dB	0.20 dB	75 dB

FO Connectors

Connector Type	LC UPC Unibody Simplex
Housing	Plastic, Blue
Ferrule	Zirconia Straight Split, Spring-loaded Axially
Ferrul Hole	125.5 μ
Ferrule Concentricity	≤ 0.6 μ
Mating Cycles	500
Operating temperature	-40°C up to +75°C
Strain Relief to	100 N
Manufacturer	tde

Optical performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
9/125 μ	LC UPC	1310 / 1550 nm	≤ 0.10 dB	0.25 dB	55 dB

FO Fiber

Type	Corning SMF-28e+ [®] 09/125 μ OS2 G.652.D singlemode fiber
Maximum Attenuation	At 1310 nm max. 0.33 - 0.35 dB/km At 1383 ± 3 nm max. 0.31 - 0.35 dB/km At 1490 nm max. 0.21 - 0.24 dB/km At 1550 nm max. 0.19 - 0.20 dB/km At 1625 nm max. 0.20 - 0.23 dB/km
Attenuation vs. Wavelength	Range: 1285 - 1330 nm; Ref. λ : 1310 nm; Max. Difference: 0.03 dB/km Range: 1525 - 1575 nm; Ref. λ : 1550 nm; Max. Difference: 0.02 dB/km

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Macrobend Loss	Mandrel Diameter:32mm; Number of Turns: 1; Wavelength: 1550nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:50mm; Number of Turns: 100; Wavelength: 1310nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:50mm; Number of Turns: 100; Wavelength: 1550nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:60mm; Number of Turns: 100; Wavelength: 1625nm; Induced Attenuation: ≤0.03 dB
Point Discontinuity	Wavelength: 1310 nm; Point Discontinuity: ≤ 0.05 dB Wavelength: 1550 nm; Point Discontinuity: ≤ 0.05 dB
Cable Cutoff Wavelength (λ_{ccf})	$\lambda_{ccf} \leq 1260$ nm
Mode-Field Diameter	At 1310 nm = 9.2 ± 0.4 μm At 1550 nm = 10.4 ± 0.5 μm
Dispersion	At 1550 nm = ≤ 18.0 [ps/(nm*km)] At 1625 nm = ≤ 22.0 [ps/(nm*km)]
	Zero Dispersion Wavelength (λ_0): 1310 nm $\leq \lambda_0 \leq$ 1324 nm Zero Dispersion Slope (S_0): ≤ 0.092 ps/(nm ² *km)
Polarization Mode Dispersion (PMD)	PMD Link Design Value = ≤ 0.06 ps/√km Maximum Individual Fiber = ≤ 0.1 ps/√km
Norm	ITU-T Recommendation G.652 (Tables A, B, C, and D) IEC Specifications 60793-2-50 Type B1.3 TIA/EIA 492-CAAB Telcordia Generic Requirements GR-20-CORE ISO 11801 OS2

Dimensional Specifications

Fiber Curl	≥ 4.0 m radius of curvature
Cladding Diameter	125.0 ± 0.7 μm
Core-Clad Concentricity	≤ 0.5 μm
Cladding Non-Circularity	≤ 0.7%
Coating Diameter	242 ± 5 μm
Coating-Cladding Concentricity	< 12 μm

Environmental Specifications

Environmental Test	Test Condition	Induced Attenuation 1310 nm, 1550 nm & 1625 nm
Temperature Dependence	-60°C to +85°C	≤ 0.05
Temperature Humidity Cycling	-10°C to +85°C up to 98% RH	≤ 0.05
Water Immersion	23°C ± 2°C	≤ 0.05
Heat Aging	85°C ± 2°C	≤ 0.05
Operating Temperature Range	-60°C to +85°C	

Mechanical Specifications

Proof Test	The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.7 GPa).
Length	Fiber lengths available up to 63.0 km/spool.

Performance Characterizations

Core Diameter	8.2 μm
Numerical Aperture	0.14

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Zero Dispersion Wavelength (λ_0)	1317 nm
Zero Dispersion Slope (S_0)	0.088 ps/(nm ² *km)
Effective Group Index of Refraction	1310 nm: 1.4676 1550 nm: 1.4682
Fatigue Resistance Parameter (nd)	20
Coating Strip Force	Dry: 0.6 lbs (3N) Wet: 14 days room temperature: 0.6 lbs (3N)
Rayleigh Backscatter Coefficient (for 1 ns Pulse Width)	1310 nm: -77 dB 1550 nm: -82 dB

Product variants & accessories

Art.-No.	Description
TSML-MS24LCAD/MPP09E	tSML - FO Module 19"/0.5U angled 4x MPO/MTP [®] Male/24x LC APC duplex 9/125 μ OS2
TSML-MS24LCD/MPP09E	tSML - FO Module 19"/0.5U angled 4x MPO/MTP [®] Male/24x LC duplex 9/125 μ OS2
TSML-MS24LCD/MPP50G3	tSML - FO Module 19"/0.5U angled 4x MPO/MTP [®] Male/24x LC duplex 50/125 μ OM3
TSML-MS24LCD/MPP50G4	tSML - FO Module 19"/0.5U angled 4x MPO/MTP [®] Male/24x LC duplex 50/125 μ OM4